

HOLLOW FAN BLADE FOR GAS TURBINE ENGINE

ABSTRACT OF THE DISCLOSURE

A hollow fan blade for turbo fan gas turbine engines is formed of two separate detail halves. Each detail half has a plurality of cavities and ribs machined out to reduce weight. These detail halves are subsequently bonded and given an airfoil shape in the forming operation. The present invention provides a hollow fan blade with internal cavity and rib geometry with improved durability that permits the bonding and forming to be performed without the need for gas pressurization. The ability to form the hollow fan blade of the present invention without gas pressurization is a result of the cavity and rib geometry and the orientation of the ribs. The ribs are tapered and transition into a compound radius of the floor that simulates the classical arch design element. The orientation of the ribs is generally in a parallel plane with the load vector that results from forming loads during the pre-form and final form operations. This orientation provides compressive stress transfer into the ribs and away from the concave and convex skins. The rib spacing is controlled where ribs can not be held in a parallel plane with the load vector.